

REMARKS

The present amendment is prepared in accordance with the requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each claim. For current amendments, inserted material is underlined and deleted material has a line there-through.

Claims 1 and 14 have been amended for clarification purposes.

No new matter has been added.

Claim Rejections - 35 USC § 103

The Examiner has rejected claims 1, 4-7, 9-12, 20, 22, 24 and 42-47 under 35 U.S.C. 103(a) as being unpatentable over Giglia (US Patent No. 4,929,502) in view of Sawan et al. (US Patent Nos. 5,817,325 or 5,681,468) as further evidenced by Palmer et al. (US Patent No. 6,406,594).

Independent claims 1, 14 and 20 are all directed to integrated papers of the invention that have a microbiological interception enhancing agent immobilized within the paper and resides throughout such integrated paper, i.e., not just on a surface thereof.

As recited in currently pending independent claim 20, the invention is directed to an integrated paper having a mean flow path of less than about 2 microns that includes a plurality of fibrillated fibers with an average fiber diameter of less than about 1000nm and active agents admixed with such fibers, both of which are immobilized within the integrated paper. The paper also includes a microbiological interception enhancing agent on at least a portion of at least some of the fibrillated fibers and/or active agents. This microbiological interception enhancing agent

comprises a biologically active metal precipitated with a counter ion of a cationic material that is residing on such fibers and/or active agents to form a colloidal metal precipitate on surfaces thereof. An essential feature of the invention is that the microbiological interception enhancing agent is also immobilized within and resides throughout the integrated paper since the fibrillated fibers and/or active agents themselves are treated with microbiological interception enhancing agent prior to forming the paper using such treated fibers and/or active agents.

Independent claims 1 and 14 have been amended to conform the claims to the invention of claim 20 and to further clarify that which applicants regard as the invention.

As recited in independent claim 1, the integrated paper has a mean pore size of less than or equal to about 2 microns, whereby the integrated paper has active particles that include a plurality of fibrillated fibers and active agents both immobilized within the paper. The fibers have an average fiber diameter of less than about 1000 nm and are fibrillated at a temperature greater than about 30°C. The active agents may include metals, metal salts, metal oxides, alumina, carbon, activated carbon, silicates, ceramics, zeolites, diatomaceous earth, activated bauxite, fuller's earth, calcium sulfate, titanium dioxide, magnesia, magnesium hydroxide, magnesium oxide, manganese oxides, iron oxides, perlite, talc, clay, bone char, calcium hydroxide, calcium salts, or combinations thereof. As recited, the microbiological interception enhancing agent resides on a portion of some of the fibrillated fibers and/or active agents that are immobilized within the integrated paper, such that, this microbiological interception enhancing agent is also immobilized within and resides throughout such integrated paper. The microbiological interception enhancing agent is a biologically active metal precipitated with a counter ion of a cationic material that is residing on the portion of fibers and/or active agents that reside within and throughout the entire thickness of the integrated paper to form a colloidal metal

precipitate within and throughout the integrated paper on a surface of such fibrillated fibers and/or active agents.

Independent claim 14 now recites and claims an integrated paper that includes a plurality of lyocell fibers, having an average fiber diameter of less than or equal to about 400 nm and fibrillated at a temperature greater than about 30°C, immobilized within and throughout the integrated paper that are admixed with activated carbon particles which are also immobilized within and throughout the paper. The activated carbon particles have a mean flow path of less than about 2 microns. The microbiological interception enhancing agent resides on a portion of some of the fibrillated lyocell fibers immobilized within said integrated paper, such that, it is also immobilized within and resides throughout the paper. This microbiological interception enhancing agent is a biologically active metal precipitated with a counter ion of a cationic material that is residing within and throughout the paper on the portion of fibers to form a colloidal metal precipitate within and throughout the paper.

As the Examiner has previously concurred, applicants continue to submit that Giglia does not disclose or suggest a microbial interception enhancing agent on portions of selected fibers. It is again submitted that Giglia (US Patent No. 4,929,502) is limited to fibrillated fiber precursors that are defined by their Canadian Standard Freeness in combination with their Tensile Strength when formed into a sheet. Giglia, Abstract. The fibers of Giglia can be used to make fabrics that comprise the fibrillated fiber alone or in combination with a particle of a toxic absorbing agent or filtration material, which may include activated carbon fibers or powders. Giglia, Col. 6, ll. 33-37. However, nowhere in Giglia is it disclosed or suggested that a microbial interception enhancing agent resides on a portion of selected ones of its fibrillated fibers and/or particles. As such, Giglia does not disclose or suggest that a microbial interception enhancing

agent resides within and throughout the integrated paper (i.e. throughout the entire thickness thereof), as is claimed.

To overcome Giglia's deficiency of not disclosing a microbial interception enhancing agent on portions of selected fibers, the Examiner cites the Sawan patents (US Patent Nos. 5,817,325 or 5,681,468) stating that such patents teaches applicant's interception enhancing agent. Applicant disagrees and continues to submit that the Sawan patents are both limited to forming surface coatings on a structure.

In particular, Sawan (US Patent No. 5,681,468 hereinafter "Sawan '468") discloses a liquid dispenser that has a filter coated on at least one surface, and also at least partially coated within a plurality of its pores, with a metallic material, e.g., a metal or metal oxide or metal salt, that is bacteriostatic or bacteriocidal. (Abstract and col. 2, ll. 11-15 and 54-67.) The filter is coated with a carbonyl compound or with an activator, followed by contact with a metal salt and an amine-containing compound solution. (Col. 4, ll. 7-24, col. 9, ll. 10-16 and col. 10, ll. 15-27 and Example 12 at col. 15, ll. 13-34.) Sawan '468 discloses that the metal salt and the amine-containing compound are in the same solution, and the carbonyl-coated filter is contacted with this solution. According to Sawan '468, the carbonyl compound reduces the metal ion to metal so as to deposit the metal on the filter surface and within pores of the filter. (Col. 9, ll. 10-52.) Sawan '468 further discloses that its metal coating preferably has a uniform metal coating thickness on the surface and within the pores of the filter. (Col. 9, ll. 44-52.)

An essential distinction between Sawan '468 and the present invention is that in Sawan '468 whether its filter is partially coated on a downstream surface, within a plurality of pores, and/or at least partially coated on an upstream surface (col. 6, ll. 42-57), the metal coating of Sawan '468 has a uniform thickness on the surface and within the pores of the filter. (Col. 9, ll.

44-52, and *See*, Examples 2-5 and 10.) That is, Sawan '468 does not disclose, contemplate or suggest precipitating a biologically active metal with a counter ion of a cationic material residing on the fibers or particles that make up an integrated paper, and then making the integrated paper using such treated fibers/particles, such that, a microbiological interception enhancing agent resides within and throughout the integrated paper, as is currently claimed.

Similarly, Sawan et al. (US Patent No. 5,817,325 hereinafter "Sawan '325") also does not overcome the deficiencies of Giglia, either alone or in combination with Sawan '468. Sawan '325 discloses an antimicrobial material of an organic material which forms a matrix and a biocidal material intercalated in the matrix to form a contact-killing coating on a substrate or to make freestanding antimicrobial films (not attached to a substrate). (Col. 4, ll. 9-32.) The compositions of Sawan '325 are applied to various substrates to form antimicrobial coatings or layers on the substrates, whereby the solution, dispersion or suspension of Sawan '325 is applied to a substrate to form the matrix. (Col. 4, ll. 33-41 and col. 8, ll. 41-43.) The solution, dispersion or suspension is applied to the substrate by any suitable means for applying a liquid coating, and then dried to form the matrix. (Col. 4, ll. 56-67.) The matrix is then contacted with the biocidal material to deposit the biocidal material into the matrix. (Col. 5, ll. 3-7 and col. 9, ll. 44-46.) Alternatively, the organic material and the biocidal material may be combined in solution and then applied to the substrate to form the matrix. (Col. 5, ll. 8-20 and col. 9, ll. 44-46.) As another embodiment, a freestanding antimicrobial film may be formed using the antimicrobial material of Sawan '325. (Col. 5, ll. 37-59 and col. 8, ll. 41-43.)

Like that of Sawan '468, Sawan '325 is limited to coatings or layers using the coating formulations disclosed therein on a wide range of materials, whereby the coating or layer is applied directly to the surfaces. (Col. 11, ll. 14-19.) Sawan '325 does not disclose, contemplate

or suggest an integrated paper made of a plurality of fibers whereby at least a portion of at least some of these fibers have been treated with a microbiological interception enhancing agent so that the microbiological interception enhancing agent resides within and throughout such integrated paper, as claimed.

Again, applicant's microbiological interception enhancing agent is integrated within and throughout the paper itself ---not just residing as a surface coating/layer on a substrate surface as is disclosed in Sawan '468 and Sawan '325.

Bearing the foregoing in mind, if one were to combine the teachings of Giglia and either Sawan patent, the antimicrobial coatings or films of Sawan would be applied to the filter medium of Giglia to form an additional layer thereon such filter medium. That is, the filter medium of Giglia would not include fibers and/or active agents having a microbiological interception enhancing agent on at least a portion of at least some of such fibers and/or active agents, whereby the microbiological interception enhancing agent is immobilized within and resides throughout the integrated paper since the fibrillated fibers and/or active agents themselves are treated with microbiological interception enhancing agent prior to forming the paper using such treated fibers and/or active agents. That is, the colloidal metal precipitate is integrated directly within and throughout the paper itself, i.e., it is not merely a coating, film or additional layering on the paper as disclosed in each of Giglia, Sawan '468 and Sawan '325.

The Examiner has also cited Palmer et al. (US Patent No. 6,406,594) for the proposition that the precipitation of additives onto papermaking fibers is known for fiber loading. However, applicants submit that this reference only refers to the precipitation of additives onto papermaking fibers in connection with precipitating filler materials, namely, calcium carbonate filler. (See, Palmer, col. 1, ll. 41-45; col. 3, ll. 10-13; col. 6, ll. 1-24; col. 9, ll. 42-45; col 12, ll.

38-50; et al.) Nowhere in Palmer et al. is it disclosed, contemplated or suggested to form a microbiological interception enhancing agent by precipitating a biologically active metal with a counter ion of a cationic material that is residing on fibers and/or active agents to form a colloidal metal precipitate on surfaces of such fibers and/or active agents, whereby these treated fibers and/or active agents are formed into an integrated paper so that the microbiological interception enhancing agent is also immobilized within and resides throughout the integrated paper. Accordingly, Palmer does not overcome the deficiencies of Giglia, Sawan '468 or Sawan '325, alone or in combination.

Further, as for the claimed pore size limitations, the Examiner has recognized that Giglia does not teach the pore size of the paper as claimed. Nevertheless, the Examiner states that "this property seems to be inherent to the paper taught by [Giglia], since they are made using the same process and using the same raw materials as claimed, or at least the minor modification to obtain the pore size in the range as claimed would have been obvious to one of ordinary skill in the art as an optimization of a result effective variable." Applicant disagrees and submits in relying on the theory of inherency, the Examiner must establish, through evidence or scientific reasoning, that the asserted inherent characteristic necessarily flows from the teachings of the prior art. *See, In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). "Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient." *Ex Parte Whalen*, 89 USPQ2d 1078, 1083 (BPAI 2008), citing *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, (CCPA 1981). *See also Ex parte Skinner*, 2 USPQ2d 1788, 1789 (BPAI 1986) ("[T]he examiner must provide some evidence or scientific reasoning to establish the reasonableness of the examiner's belief that the functional limitation is

an inherent characteristic of the prior art.") Applicant submits that there is no evidence or scientific reasoning in the record to support the Examiner's inherency rejection.

In view of the foregoing, applicant submits that neither Giglia, Sawan '468, Sawan '325 nor Palmer, alone or in any combination thereof, render obvious the present invention.

The Examiner has also rejected claims 2-3, 14 and 16-19 under 35 U.S.C. 103(a) as being unpatentable over Giglia, US Patent No. 4,929,502 in view of Sawan et al., US Patent Nos. 5,817,325 or 5,681,468 as applied to claims 1, 4-7, 9-12, 20, 22, 24 and 42-47 above, and further in view of "Complete Textile Glossary" by Celanese Acetate LLC.

For the reasons as discussed in detail above, it is submitted that neither Giglia, Sawan '468 nor Sawan '325 anticipate or render obvious claims 1, 4-7, 9-12, 20, 22, 24 and 42-47 since none of these references, alone or in combination, disclose, contemplate or suggest an integrated paper that includes a plurality of fibrillated fibers with an average fiber diameter of less than about 1000nm and active agents admixed with such fibers (both of which are immobilized within and throughout the paper), whereby the paper includes a microbiological interception enhancing agent that is immobilized within and resides throughout the integrated paper since the fibrillated fibers and/or active agents themselves are treated with microbiological interception enhancing agent prior to forming the paper using such treated fibers and/or active agents, as claimed. It is again submitted that the Celanese Acetate reference is an example of the prior art of Fiber Loading for manufacturing precipitated calcium carbonate directly within the pulp process for making stronger paper. It does not overcome the deficiencies of Giglia, Sawan '468 or Sawan '325, alone or in combination.

Applicant submits that the structures of the present invention are different from that of the cited references, such that, the cited references, either alone or in any proper combination thereof do not anticipate nor render obvious the present invention.

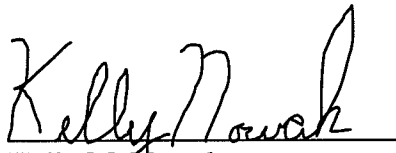
It is also submitted that the examiner has pointed to individual components of applicants claimed invention rather than taking applicants' claims as a whole. An invention "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. " *KSR Int'l Co. v. Teleflex Inc.* 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, (2007). The record must show that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* at 1741. Here the record contains no such finding. Rather, the Examiner has merely taken the position that it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify Giglia in view of Sawan '468, Sawan '325 and Palmer, or even in combination with the Celanese Acetate reference, to derive at applicant's invention. For the reasons as discussed above, this is simply not true.

Applicant submits that neither Giglia, Sawan '468, Sawan '325, Palmer, nor paper loading, contemplates or suggests that a microbiological interception enhancing agent can reside on portions of some (i.e., selected) fibers and/or active agents for forming an integrated paper so that the microbiological interception enhancing agent is integrated within and throughout the paper itself. It is only applicant's disclosure that teaches these limitations, which of course, is improper as a hindsight reconstruction of applicant's invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983) (Hindsight based on reading of the patent in issue may not be used to aid in determining obviousness). The cited references, and not in retrospect, must suggest doing what applicant has done. *In re Skoll*

(CCPA 1975) 187 USPQ 481. Likewise, hindsight and the level of ordinary skill in the art may not be used to supply a component missing from the prior art references. *Al-Site Corp. v. VSI International, Inc.*, 174 F.3d 1308, 1324, 50 USPQ2d 1161, 1171 (Fed. Cir. 1999).

For the reasons as discussed above, it is respectfully submitted that the application has now been brought into a condition where allowance of the case is proper. Reconsideration and issuance of a Notice of Allowance are respectfully solicited.

Respectfully submitted,

A handwritten signature in cursive script, reading "Kelly M. Nowak", written over a horizontal line.

Kelly M. Nowak
Reg. No. 47,898

DeLIO & PETERSON, LLC
121 Whitney Avenue
New Haven, CT 06510-1241
(203) 787-0595